

SELAGINELLA GYPSOPHILA
(SELAGINELLACEAE), YET ANOTHER NEW
EDAPHIC ENDEMIC FROM NORTHERN MEXICO

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SELAGINELLA GYPSOPHILA Smith & Reeves, sp. nov. (Figs. 1 and 2).

Ex affinitate *S. piliferae* A. Braun et specierum affinium statura parvula, foliis intermediis ellipticis coriaceis bicoloribus margine albidis, sine seta apicali, ramulis (foliis inclusis 1.5–2.0 mm latis distinguenda.

The following description is based upon pressed specimens of dry, inrolled plants.

Plants rosulate, hygroscopic, inrolled when dry; stems densely cespitose, ascending, anisotomously branched with the distal branching dichotomously flabellate, branch systems ("fronds") strongly dorsiventral, not "stipitate" or with a short (to 1.5 cm) unbranched basal portion, green above, yellowish- or whitish-green below, older leaves drying uniformly tan; branches strongly ascending; leaves anisophyllous, both median and lateral leaves 2-ranked, closely imbricate, elliptic, acutish or narrowly rounded at apex, the lateral 1.4–2.0 mm long, 0.7–0.9 mm wide, strongly oblique to axis (ascending at ca 45° angle), ciliolate along upper margin (hairs 0.05–0.10 mm long), mostly entire along lower margin (except at base), bicolorous, lower surface with broad whitish opaque margins up to ca 0.3 mm wide and a green central band that is equal to or less than the width of the whitish margins, on upper surface green central band much broader than whitish margins; median leaves 1.0–1.3 mm long, 0.4–0.5 mm wide, subacute to narrowly rounded at tip, lacking an apical seta, with broad whitish margins 0.15–0.20 mm wide, mostly entire to minutely and remotely denticulate along outer margin, closely denticulate (apical half) to minutely ciliate (basal half) along inner margin, hairs 0.05–0.10 mm long, color pattern reversed from that of lateral leaves, the upper surface with narrow dark green median band, the lower surface with broad green median band; axillary leaves similar to lateral leaves but more nearly equilateral and ciliolate along both margins, base with two minute, ciliolate lobes; strobili at ends of ultimate branchlets, strongly quadrangular, up to 1.5 cm long and 1.0–1.5 (3.0 after sporangia dehisce) mm diameter; sporophylls broadly ovate-deltoid (basal corners clasping sporangia), acute at tip, lacking apical

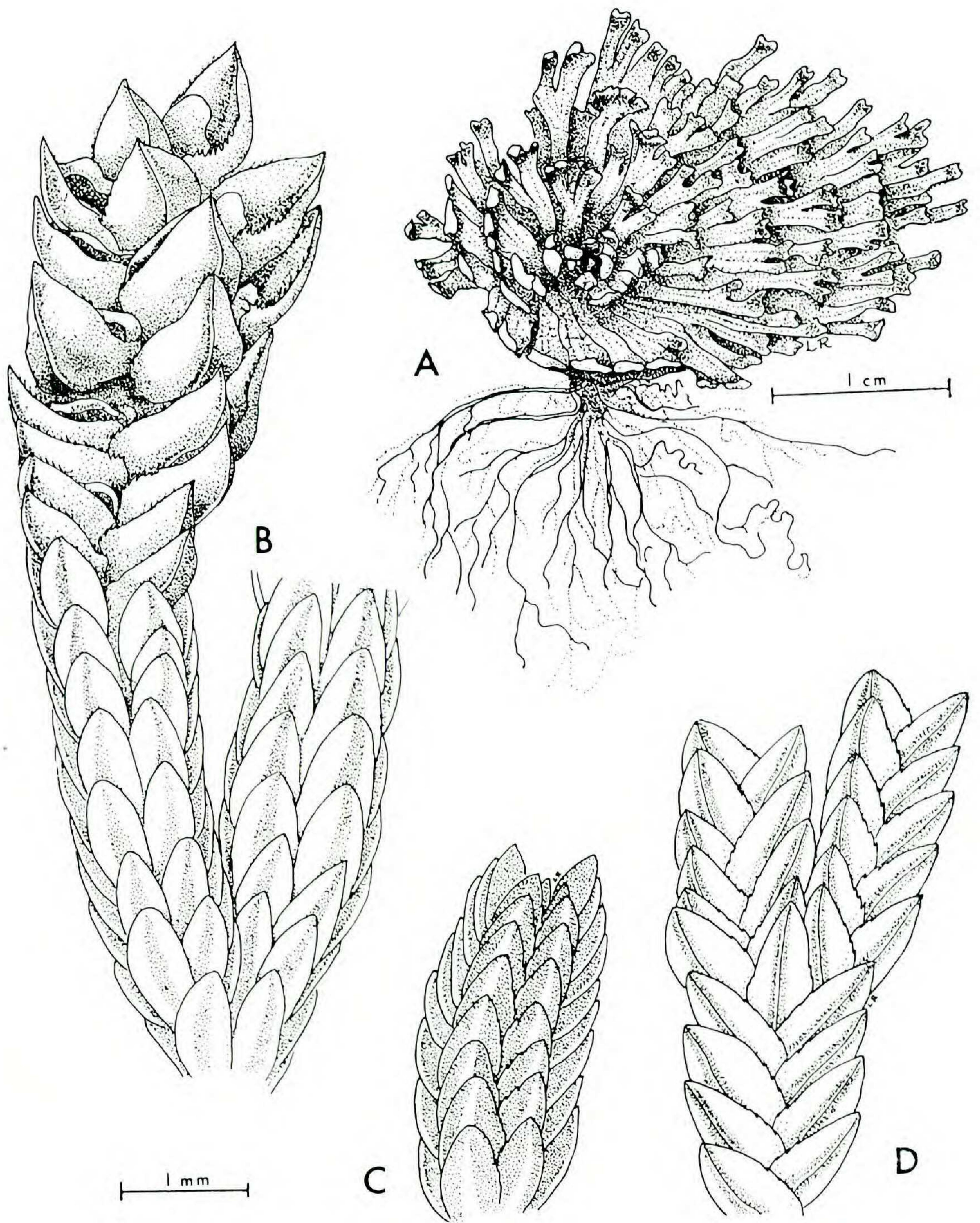


Figure 1. *Selaginella gypsophila* Smith & Reeves (Dorr 2550). A. Habit; wet, expanded plant. B. Branch with strobilus, upper surface; dry, incurled plant. C. Portion of branch, upper surface; wet, expanded plant. D. Portion of branch, lower surface; dry, incurled plant.

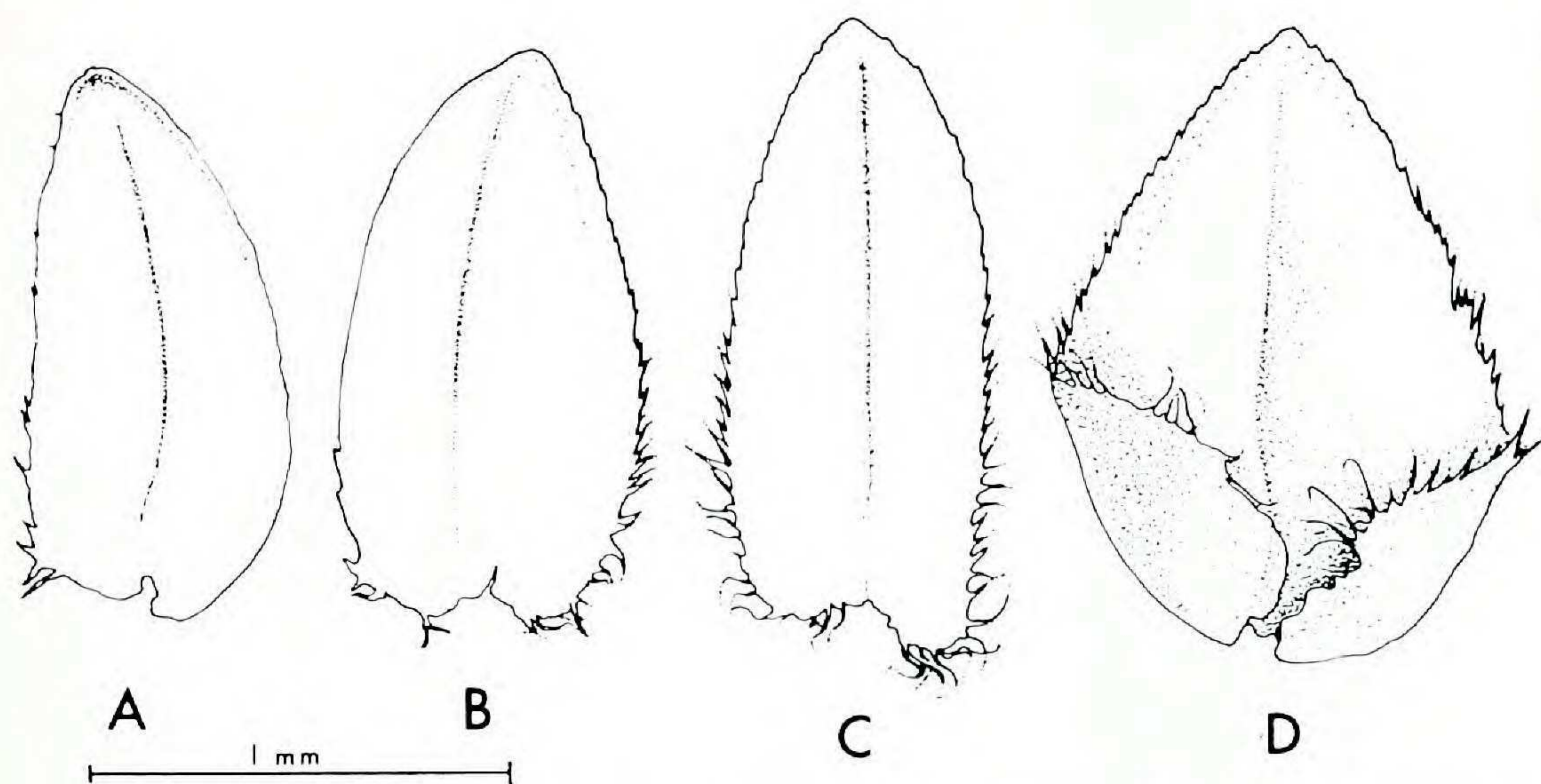


Figure 2. Leaves of *S. gypsophila* (Dorr 2550). Tracings of leaves mounted and cleared in Hoyer's. A. Median leaf. B. Lateral leaf. C. Axillary leaf. D. Megasporophyll showing basal corners that clasp sporangium.

setae, prominently carinate on back, spreading with age, ca 1.2–1.5 mm long, ciliolate on whitish margin, hairs up to 0.1 mm long; megasporangia few, basal, in a vertical file in strobilus, or scattered in one or two vertical files; megaspores yellow, up to four per sporangium, ca 300 μm diameter, with fine reticulate ridges, but at low magnification (30 \times) appearing smooth except for the triradiate scar; microsporangia numerous, with microspores bright orangish-red, capitate-papillate or tuberculate, shed in tetrads (and singly).

Plants that have been rehydrated and allowed to expand show some differences from the above description. The lateral leaves spread somewhat more widely from the stem when wet. Also, the median band on the upper surface of the median leaves and the lower surface of the lateral leaves is paler (not darker) than adjacent tissue.

TYPE: MEXICO. NEUVO LEÓN: Munic. Galeana, low gypsum hills S of Cerro Potosí, ca 2 mi N of Ejido Santo Domingo and ca 7 mi NE of San Roberto Junction (Hwys 57 & 58), 24°45'N, 100°12'W, 2100 m, 24 Oct 1982, L. J. Dorr 2553, with J. Grimes, K. C. Nixon, S. Sundberg (HOLOTYPE: UC; ISOTYPES: GH, MEXU, MICH, MO, NY, TEX, US).

PARATYPE: same locality, Dorr 2550 (MEXU, TEX, UC).

Gypseous soils of northern Mexico continue to be the source of many novelties (Turner & Powell, 1979). This remarkable new *Selaginella* was discovered growing both on gypseous soils (2553) and on the surface of a

gypsum mine (2550); the two populations were several hundred meters apart. According to the collector, the area was relatively barren except for the presence of scattered plants of *Notholaena bryopoda* Maxon and *Heterotoma pringlei* B. L. Robinson. The two gatherings of *Selaginella* comprise a total of about 50 plants, the largest of which is about 11 cm across. Other associates in the area included *Hedeoma ciliolatum* (Epling & Stewart) Irving, *Houstonia rubra* Cav., *Brickellia nelsonii* B. L. Robinson, *Helianthella gypsophila* Turner, *Pinus arizonica* Engelm., *Polygala* sp., and *Cheilanthes cochisensis* (Godd.) Mickel, this last species on non-gypsophilous soil.

Selaginella gypsophila is a member of subg. *Stachygynandrum* (Beauv.) Baker, more specifically of the group of *S. lepidophylla* (Hook. & Grev.) Spring, or "resurrection ferns," comprising also *S. pilifera* A. Braun, *S. novoleonensis* Hieron., *S. convoluta* (Arn.) Spring, and *S. pallescens* (Presl) Spring (Alston, 1955). This group is centered in northern Mexico. From *S. lepidophylla*, our new species differs by having elliptical median leaves (vs. nearly round or broadly ovate), lacking a dense fringe of hairs from a scarious margin, lateral leaves aging tan beneath (vs. dark red-brown), megaspores with fine reticulate ridges (vs. strongly reticulate ridges), and microspores darker reddish-orange and capitate-papillate or tuberculate (vs. strongly ridged). The microspore tetrads in *S. lepidophylla* are enclosed in an "extra tetrad wall" which is not present around tetrads in *S. gypsophila*. Also, the leaves of *S. lepidophylla* do not have a contrasting central band, and the basal corners of the sporophylls do not clasp the sporangia. From *S. novoleonensis*, it can be distinguished by the non-aristate median leaves, leaves with central green band darker than adjacent tissue in dry condition (vs. central green band lighter than adjacent tissue when dry or wet), the older leaves drying tan (vs. dark brown), the finely reticulate megaspores (vs. strongly reticulate), the capitate-papillate or tuberculate microspores (vs. strongly ridged), the lack of an "extra tetrad wall" enclosing microspores, and the non-clasping sporophylls. *Selaginella convoluta* differs in having more ovate median leaves, lateral and median leaves more acute (median sometimes aristate) and without contrasting median band, more widely divergent lateral leaves (ca 60°–80° from axis), coarse cilia along all leaf margins, yellow-orange microspores that are roughened with low tubercles, whitish and coarsely tuberculate megaspores, non-clasping sporophylls, and a silvery sheen on under surface of the lateral leaves. From *S. pilifera*, perhaps its closest relative, it differs in lacking apical setae on the median and lateral leaves, lateral leaves much less widely divergent from axis, and lacking the silvery sheen of the under surface of the lateral leaves. The megaspores of *S. pilifera* are whitish. *Selaginella pilifera* has weakly bicolorous leaves, in contrast to the rather sharply bicolorous leaves of *S. gypsophila* (the color pattern is very similar). The median leaves of *S. pilifera* are more elliptic than other species in the group and thus more similar to *S. gypsophila*. Additional similarities between the two are the

clasping sporophylls, spore ornamentation, and having microspores shed in tetrads as well as singly. *Selaginella pallescens* seems less closely related, having setate leaves with conspicuous and clearly defined white margins with longer and more numerous cilia, leaves without contrasting central band, a more frondose branching pattern, often elongate-stipitate fronds, more divergent lateral leaves, whitish megaspore, and microspores shed mostly singly (rarely in tetrads). Megaspore ornamentation, microspore color (ornamentation varies from inconspicuously low-tuberculate to capitate-papillate), and clasping sporophylls in *S. pallescens* are similar to *S. gypsophila*.

A single specimen on the holotype sheet ("A") has the median and lateral leaves awned to 0.5 mm; however, these awns are not as long as those found in *S. pilifera* where they are half to equalling the leaf length. This specimen is excluded from our concept of the species pending further study of additional collections. It may, however, represent only an extreme variation. In other aspects, it appears essentially identical to other specimens of the type gathering.

ACKNOWLEDGMENTS

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